ENTOMOLOGICAL NEWS

VOLUME LV, 1944

PHILIP P. CALVERT, EDITOR EMERITUS

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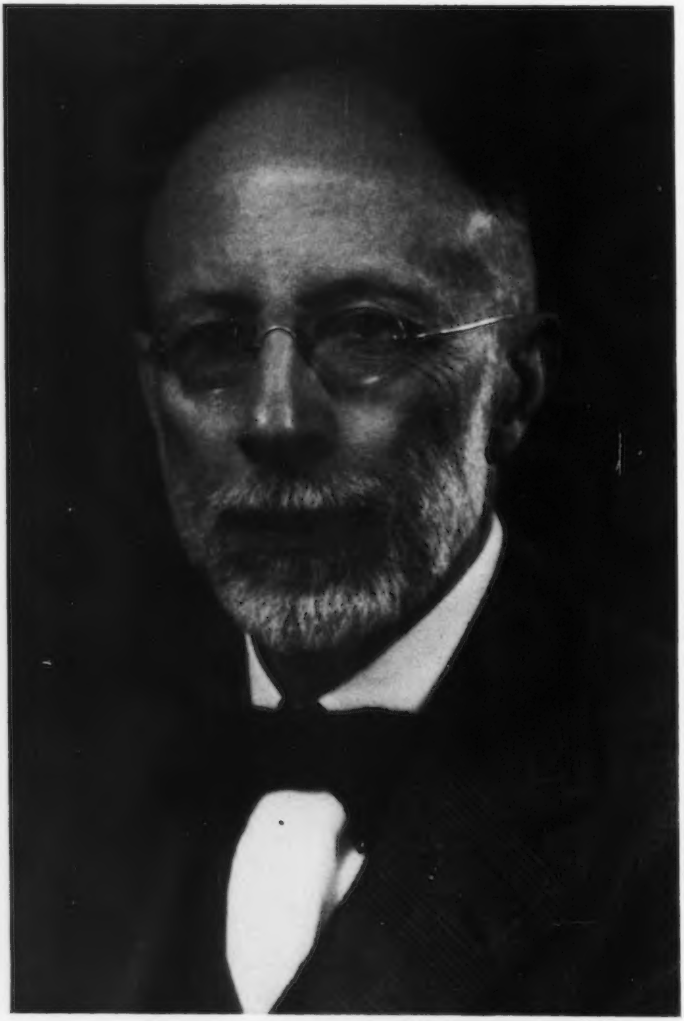

PHILIP POWELL CALVERT

ENTOMOLOGICAL NEWS

VOL. LV JANUARY, 1944 No. 1

Philip Powell Calvert—Editor Emeritus

Recently the following letter was received by the Society:

September 29, 1943

MR. JAMES A. G. REHN
President, American Entomological Society,
Chairman, Publication Committee of the same

Dear Mr. Rehn:

In accordance with my letter of May 20 last to you, and to clear matters for the approaching meeting of the editorial staff of ENTOMOLOGICAL NEWS on Tuesday next, October 5, I hereby tender my resignation as Editor of the NEWS.

Yours very truly,
(signed) PHILIP P. CALVERT

At the stated meetings of the Council and of the Society on October 28, 1943, Dr. Calvert's resignation was accepted. The Society, expressing for all of us the gratitude we feel for his many years of service, unanimously elected Dr. Calvert EDITOR EMERITUS.

For several reasons we approach with diffidence the task of choosing words to convey our tribute to the Editor Emeritus. Between what we would be justified in saying in his praise and what that modest man would read without discomfort, there is a considerable gap. Besides, we are confronted with the knowledge that the Editor Emeritus given the academic problem of writing such a tribute would do a better job.

Dr. Calvert was born in Philadelphia on January 29, 1871, and attended the University of Pennsylvania where he received a certificate in 1892 and a Ph.D. in 1895. After a year of post-

doctoral study in Germany, he returned to the University of Pennsylvania, and served on the staff of the Zoology Department until his retirement as Professor Emeritus in 1939. He became an associate in the American Entomological Society in 1888, and is now a member of numerous societies. He is also past President of both the American Entomological Society and the Entomological Society of America. All his life he has been interested in the Odonata. He was author of the Odonata section of Biologia Centrali-Americana, and his numerous papers on the taxonomy, biology and growth of dragonflies are well known.

Since his publications and standing in entomology speak for him as a scientist, and since the host of friends and acquaintances who wish him well speak for him as a man, we will confine ourselves to speaking of the Editor Emeritus as Editor—or Seasoner. He was a member of the advisory board when the NEWS was founded 54 years ago. A few years later he became associate editor, and, in 1911, editor. For 33 years he has been seasoning the NEWS * with his own particular flavor which in terms of the kitchen we might describe as well salted, with a judicious use of pepper. The pepper may have caused an eye to smart now and again but we think the consensus of opinion is that the flavor has been agreeable. If you find the flavor of the NEWS lasting it will be because we have succeeded in keeping his new title printed EDITOR emeritus.

The Publication Committee of the Society decided to continue the editorship of the NEWS in the hands of the editorial board composed of Ezra T. Cresson, Jr., E. J. F. Marx, James A. G. Rehn, A. Glenn Richards, Jr., and R. G. Schmieder. Drs. Richards and Schmieder were named co-editors. Messrs. Cresson, Marx, and Rehn will assist with part of the editorial work and handle the necessary business aspects of the journal.

* For a survey of the history of ENTOMOLOGICAL NEWS see the article by E. T. Cresson, Jr., entitled "In retrospect," ENT. NEWS, vol. 54, pp. 164–166, 219–222. 1943.

Taxonomic Notes on Brachycercus lacustris (Needham) (Ephemeroptera).[1]

By F. Earle Lyman, Norris, Tennessee.

Brachycercus lacustris (Needham) was originally described (1918) as *Caenis lacustris* Needham from nymphal material only that had been collected from Oneida Lake, New York. In this description the specimen referred to as of their species and taken from Walnut Lake, Michigan, but which Needham had formerly considered as *Ephemerella* sp. in the report of the Geological Survey of Michigan, 1907, may well have been *Ephemerella temporalis* McDunnough, since individuals of this species are quite numerous in Walnut Lake during May, at which time the specimen referred to by Needham was collected. *Ephemerella temporalis* has very prominent occipital tubercles. Moreover, *B. lacustris* does not begin to emerge until about mid-summer and records have not demonstrated its presence as early as May in the nymphal stage.

Ide (1930) described *Eurycaenis pallidus* Ide from only three male imagoes taken at Daventry, Ontario, and at the same time pointed out that these mayflies might well be the adults of *Caenis lacustris*. Lestage (1931) transferred *E. pallidus* Ide to the genus *Brachycercus* but since the name, *pallidus*, had already been used for a species of this genus, Lestage proposed the new name, *Brachycercus idei* Lestage, for Ide's species.

Traver (1932) considered *Caenis lacustris* Needham as belonging in the genus *Eurycaenis* and in discussion of *E. nitidus* Traver stated that *nitidus* might be synonymous with *E. pallidus* Ide but that the nymph of *nitidus* having conspicuous lateral tubercles on the prothorax was distinct from that of *E. lacustris* (Needham). As will be shown below *E. nitidus* Traver could not, therefore, be synonymous with *E. pallidus* Ide. Traver (1935) placed *E. lacustris* (Needham) in the genus *Brachycercus*.

[1] Contribution from the Biological Station and Department of Zoology, University of Michigan.

Collections of adults from the field and also laboratory reared specimens from Douglas Lake, Michigan, according to Ide's original description, belong to the species *Brachycercus idei* Lestage. However, the nymphs from which these adults were reared clearly belong to *Brachycercus lacustris* (Needham). Consequently, the name *B. idei* Lestage falls to synonymy with *B. lacustris* (Needham) by priority, and the latter name should be used to designate the species.

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Laccophilus shermani, a New Species of Water Beetle from Arizona and Texas (Coleoptera: Dytiscidae).[1]

By HUGH B. LEECH, Vernon, British Columbia.

Laccophilus shermani new species

A species allied to and resembling *L. decipiens* LeConte. It has been identified as *fusculus* Sharp, by some authors. Dedicated to Mr. John D. Sherman, Jr., whose interest in the Dytiscidae and large collection inspired and made possible most of the fine studies in the family by the late Dr. H. C. Fall.

Male: Length 6.1 mm., width 3.3 mm. *Head*, pronotum and elytra pale brownish-yellow, head infuscate at base; *elytra* irrorate with brown (the tiny spots tending to form longitudinal chains), except on following areas which are not irrorate and thus stand out as maculae on each elytron: The side margin and

[1] Contribution No. 2259, Division of Entomology, Science Service, Department of Agriculture, Ottawa, Ont.

a subhumeral, median, postmedian and preapical inward extension of it; the extreme base and a prehumeral enlargement; two faint and one larger elongate spots between subhumeral and suture; a slightly postmedian sutural spot; and two elongate spots between post-median lateral, and suture. *Epipleurae* pale yellow; prosternum and legs brownish-yellow, prosternal process and tarsi darker. *Metasternum,* metacoxal plates and abdominal sternites more rufous.

Meshes of elytral sculpture fine, nearly equal except near suture. Pro- and mesotarsal claws simple. *Metacoxal* file consisting of about 23 equidistant impressed lines; interspaces each at least three times as wide as impressed line, but convex, the lines thus appearing to be broader than they are. *Aedeagus* narrowed and thickened apically, sinuate, with a distinct subapical sinus on one side.

Female: Length 5.75 mm.; width 3.5 mm. Similar to male in color except that pale spots on elytra are smaller, and less numerous basally; under-surface paler than in male. Metacoxal file absent. Elytral margin from just behind middle to apical fifth extended in a thin arcuate flange which on the underside forms an epipleural area as broad as at base of epipleuron.

Holotype male and *allotype* female, collected at Bear Canyon, Santa Catalina Mountains, ARIZONA, January 2, 1938, by Edwin C. Van Dyke (Canadian National Coll.). Also 17 *paratypes* as follows: 1 ♂ and 5 ♀ topotypes; 1 ♂, Sabino Canyon, Sta. Catalina Mts., Ariz. (J. W. Tilden); 5 ♂, 4 ♀, San Xavier Mission, Pima Co., Ariz., October 2, 1932 (D. K. Duncan); 1 ♂, Phoenix, Ariz., June 17 (E. A. Schwarz). The following additional specimens have been seen: 1 ♂, Globe, Ariz., April 10, 1921 (F. A. Sherriff); 1 ♀, Pima Co., Ariz., October 21, 1924 (A. A. Nichol); 1 ♀, "Tex."; 3 ♂, 3 ♀, 1 mi. N. of Fort Davis, Davis Mts., TEXAS, July 16, 1941 (Burdette E. White). Paratypes will be distributed to: The United States National Museum, the California Academy of Sciences, the British Museum, the Academy of Natural Sciences of Philadelphia and to Dr. F. N. Young.

The paratypes vary as to the number and distinctness of the white markings on the elytra. Two of the topotypical females and two from the Davis Mts., Texas, have the elytra broadly explanate posteriorly as in the allotype, two others have it faintly explanate, while in the rest the margin is as in the males.

L. shermani resembles the common *decipiens* LeConte, whose range extends from Alaska to Lower California and from Alberta to Colorado and Utah, but has a distinctly more rufous color; males may be separated as follows:

Metacoxal file consisting of 30 to 35 impressed narrow lines, the interspaces flat, and about 4 times as broad as the lines, the file appearing to be smooth. Apical fifth of aedeagus flattened, blunt, faintly notched on one side ..... *decipiens*

Metacoxal file of 20 to 25 narrow lines, the interspaces about 3 times as wide as the lines, but inflated, so that the lines look broader than they are, and the file rough. Apical fifth of aedeagus not flattened, but narrower and sinuate, with a sinus on one side ..... *shermani*

Well marked examples of *shermani* also resemble *L. maculosus* (Germar), but in the latter the elongate basal maculae arise from the base, are much larger, and margined with black; in the male the outer interspaces of the metacoxal file are progressively narrower, not of uniform width as in *shermani* and *decipiens*.

There is little chance that *shermani* is the same as *L. fusculus* Sharp. Sharp based his species on one female from Nevada, and distinguished it from *decipiens* by its smaller size (5.25 × 3 mm., as against 5.75 × 3.5 mm.), "very much narrower form," and "vertice capitis prothoracisque disco obscurioribus; coxis posterioribus fuscis." *L. shermani* averages a little larger than *decipiens*, and is if anything lighter, not darker, above and beneath. I have a small narrow female of *decipiens* from Gunnison, Colorado, which fits Sharp's description of *fusculus* perfectly.

A Note on the Habits of Trypoxylon politum Say (Hymenoptera: Sphecidae).

By Carl G. Hartman, Urbana, Illinois.

The habits of *Trypoxylon politum* have been extensively studied and described, mostly under the older name, *T. albitarse*. The observations concern mostly the comings and goings of the female as she brings in her captured spiders or returns to the nest with a pellet of mud for the partitions. Examination of the nest and an analysis of its contents have also added greatly to our information, and the behavior of the male as he "guards" the nest in the absence of the female is a matter of common knowledge.

By means of the glass-tube method (see Natural History, Dec. 1941) it was possible for the writer, assisted by Philip and Paul Hartman, to observe some of the activities of a number of *Trypoxylon* pairs as they worked within their transparent abodes.

The glass tube presented for occupancy to this largest member of the genus was about 5–6 mm. in inside diameter, large enough for the smaller male to turn around inside, too small for the female which had to turn around outside and back in when the occasion demanded for the change of orientation, as for example to lay her egg.

Epeirids of various sizes and colors are collected by this species. As they are stored they are pushed in as deeply as possible, the female using her head as a "tamper." Not infrequently the spiders will be scattered along the tube only to be pressed again into a compact mass.

Aside from standing watch, with head towards the opening, in the absence of the female, the male was in a number of instances seen to push in the spiders. Our motion pictures show one male gathering up the spiders which the female had left strewn along the whole length of the tube. From a behavioristic standpoint it is interesting to note that the male is capable of participating at least to some extent, in the activities of the "household."

When two tubes, occupied by two pairs of wasps are situated close together, the male does not confine his attention to his own mate but may meet the female from the adjoining apartment and mount in the characteristic manner of the genus and enter the tube with her.

In our experience the egg is laid on the dorsal surface of a large spider, never on a small one. In one instance the last spider brought in, being small, was rejected as the recipient of the egg. After considerable shuffling of the collected prey, a large spider was selected for the purpose. This performance constitutes one of the scenes of our motion picture, just preceding that of egg laying, and at least *looks* as though the wasp were "selecting."

The signal for egg laying is the female's change of orientation in the tube. Whereas for placing the spiders and building the partitions she works as she enters, namely, head downward looking into the tube, to lay the egg she comes out, turns around and backs in. After a minute or two of the usual and almost constant preening (cleaning the antennae with the forelegs and the abdomen with the hind legs and these in turn by rubbing them together), she is ready for oviposition. As in *Odynerus,* the expulsion of the egg is preceded and accompanied by rhythmic abdominal contractions of a much slower rhythm than the breathing movements. It is a matter of but a few minutes after the egg first appears before it is placed on the dorsal surface of the spider's abdomen. The egg is simply dropped in its place by virtue of the fact that the wasp places the abdomen on the appropriate part of the body of the spider which is to receive the egg—the same relative spot which countless ancestors have used each recurrent season for eons past.

Correction: to "Notes on Mosquitoes of Missouri," published in these ENTOMOLOGICAL NEWS, November, 1943, p. 234: AEDES DEORALIS should be AEDES DORSALIS. [Editors.]

The Prey and Hunting Habits of the Wasp, Trypoxylon politum Say.

By Phil Rau, Kirkwood, Missouri.

In my previous papers describing the behavior of this builder of pipe-organ nests, an insect probably better known by the old specific name of *albitarsis*,* no mention is made of the kind of spiders it hunts or its method of hunting them. It is indeed a rare occasion when one finds this species in a hunting mood, and although I have made but one observation on this behavior, it is sufficient, I think, to show how deliberately this business is gone about.

On the front porch of my home one sunny afternoon, a female *T. politum* flew directly into the web of a house spider in a corner. This looked at first to me like suicide for her, but the spider did not come out to grapple with her as I expected. Probably this was also as the wasp expected, for after waiting quietly for a half minute or so, she spread her legs and gave the web a half dozen shakes. This brought no result, and the wasp waited quietly for three or four minutes more and then repeated the performance. Again she shook the web—four or five times—and then rested quietly on it for a few seconds and finally, in apparent disgust, flew into another web on the opposite wall, behaved in the same way—with the same result—and finally, empty-handed, flew into the garden.

If intelligence can be attributed to any insect, I think her behavior may be called intelligent, all the more so because she "chose" her position in the web so as not to become entangled in it.

The following is the record of the species of spiders collected by another mother wasp at Lesterville, Missouri, July 24–26, 1938, and placed in three cells of her nest. There were altogether 29 spiders of which 25 belonged to one species, *Neoscona benjaminus* Walck. [det. by E. B. Bryant]. All were half-

* For the life history of this wasp see Journ. Anim. Behavior 6: 27–63, 1916, and Trans. Acad. Sci. St. Louis 25: 428–39, 1928.

grown, and both sexes were equally represented. The others were, one each of *Epeira domiciliorum* Hentz, *E. prompta* Hentz, *E. parvula* Keys and Emer., and *Eustala anastera* Walk. [all determined by E. B. Bryant].

Notes on the Habits of Monobia quadridens (Linn.) [1]

By S. W. Frost, The Pennsylvania State College

Monobia quadridens (Linn.) is a common wasp throughout Eastern United States. This striking black species is 20 mm. long with contrasting cream-colored markings; a broad band along the distal edge of the first abdominal segment, a band across the scutellum and marks on each anterior angle of the pronotum. This, the only North American species of the genus *Monobia,* belongs to the family Vespidae and subfamily Eumeninae. *Monobia* is an American genus with several species described from Central and South America. Records indicate that *Monobia quadridens* generally nests in the abandoned burrows of wood borers, especially those of *Xylocopa.*

The following observations were made by means of six-inch glass tubes of 10 mm. bore placed in a darkened box with their outer ends exposed. This observation box, for solitary bees and wasps, will be described elsewhere. The tubes were ready for occupation on May 1. Although many solitary bees and wasps occupied these tubes early in the summer, *Monobia quadridens* did not show interest in them until June 26. On this date a female was observed inspecting them and she finally selected one for her nest. From June 27 until July 20 a succession of tubes was used apparently by the same wasp. A total of 11 cells was completed in 5 of these tubes. The wasp was not marked but the fact that a new tube was never occupied until the preceding tube was entirely provisioned and

[1] Authorized for publication on November 26, 1943, as paper No. 1209 in the Journal Series of the Pennsylvania Agricultural Experiment Station.

sealed, although seven other tubes were always available, led the writer to believe that only one female was concerned.

The procedure of constructing the cells was generally the same. A mud partition, about 3/16 of an inch thick, was built across the inner end of the tube. The female suspended her egg from the ceiling of the tube before any provision was brought in. The larvae of the grape leaf folder *Desmia funeralis* were used entirely by this wasp as provision. The number placed in each cell varied from 7 to 13. After she had placed a sufficient number of larvae in a cell, she closed it with another mud partition about 3/16 of an inch thick. This partition formed the inner end of the next cell. The cells varied somewhat in length but averaged one and one-eighth inches long. After the female had provisioned and sealed two or three of these cells, she left an open space and finally plugged the tube with mud leaving a vestibule at the outer end.

The female rested every night in the tube in which she was building. Her abdomen was pressed against the mud partition of the last cell and she faced the open end of the tube. She remained in the tube until at least 7 A.M. apparently waiting for warm dry weather in which to work. During cool, rainy weather she remained in the tube all day long. Pulling the tube out for examination did not disturb her.

A summary of the cells built by a female *Monobia quadridens* (L.)

Tube Number	*Number of cells in each tube*	*Number of larvae in each cell*	*Cells Started*	*Cells Finished*	*Notes*
1	2	8–13	June 26	June 27	Warm
2	2	8–7	June 27	June 28	Warm, clear
3	3	13–8–1 [2]	June 30	July 5	Cool, rainy
4	3	7–8–8	July 10	July 14	Cool
5	1	0 [3]	July 14	——	Warm, clear
6	1	9	July 15	July 19	Warm, clear
7	1	0 [3]	July 20	——	Warm, clear

The habit of depositing the egg before storing food in the cell is contrary to the habits of many solitary insects. The mud

[2] The egg and this larva were removed by the female or a predator before the tube was sealed.

[3] An egg was laid but it disappeared later.

dauber, *Sceliphron,* attaches its egg to one of the spiders in the cell and therefore brings in provision first. Solitary bees using pollen as food accumulate provision before laying their eggs. In every case *Monobia quadridens* laid its egg before bringing in the *Desmia* larvae.

The larvae of the grape leaf folder, *Desmia funeralis,* was used entirely as provision by *Monobia quadridens.* How she found so many of these larvae is amazing. A grape vine about fifteen feet from the nest was sprayed frequently during the summer and had few or none of these larvae. A search of my neighbor's unsprayed grape vine also yielded none. However, wasps have ways of finding their prey. I have watched *Chalybion californicum* (Sauss.) [4] deliberately entangle itself in a spider's web and seize the spider when it rushed forth. This wasp is strong enough to free itself from the spider's web. The presence of grape leaf folders throughout a large part of the summer favors *Monobia.* The grape leaf folder is quite common about State College, Pennsylvania, especially upon wild grapes. There are two generations of this insect a year so that larvae are present almost continually from early June to the end of September. I must admit that the finest specimens of *Desmia funeralis* larvae in our collection of immature insects were taken from the cells of *Monobia quadridens.*

Various accounts state that *Monobia quadridens* provisions its cells with cutworms. This may be the rule but certainly the female under observation had nothing to do with these "lowly worms."

Although the *Desmia* larvae were paralyzed by the wasps when placed in their cells, they continued to defecate and in a few days the glass tubes became smeared with fecula. Mold developed on some of the *Desmia* larvae. No doubt this condition does not exist under natural conditions because the moisture of the fecula would be absorbed by the porous walls of the cells which are usually made in the abandoned burrows of wood borers.

[4] *cyaneum* of authors.

Rau (1931) states that *Monobia quadridens* builds a double wall between each cell. This was not true in the case of the nests built in glass tubes. However, two partitions were built at the outer end of the tubes, one closing the last cell and the second at the outer end of the tube.

About July 14 the activities of this wasp became irregular. From the preceding summary it will be seen that eggs were laid by the wasp in cells numbers 5 and 7 on July 14 and July 20 but these cells were not completely provisioned. The tubes containing these were finally closed by plugs at the outer ends. Whether this marks the end of the wasp's activities for the summer or whether she had fallen prey to some bird or met another mishap, is not known. Although this wasp did not occupy the glass tubes again during 1943, adults were seen in foliage nearby as late as the middle of August indicating that they were probably constructing nests elsewhere. Other workers have observed these wasps building nests until late September.

It was questionable whether these wasps would develop in glass tubes because of the excess moisture from the fecula of the *Desmia* larvae. However, pupae were formed in several of the tubes. One of the larvae in tube No. 4 and that in tube No. 6 were permitted to develop normally. On August 10 the larva in tube No. 4 had transformed to a cream colored, naked pupa. That in tube No. 6 did not transform until August 13. The adult in tube No. 4 emerged on September 4, that in tube No. 6 did not emerge until September 8. It appears that *Monobia quadridens* hibernates as adults in this latitude.

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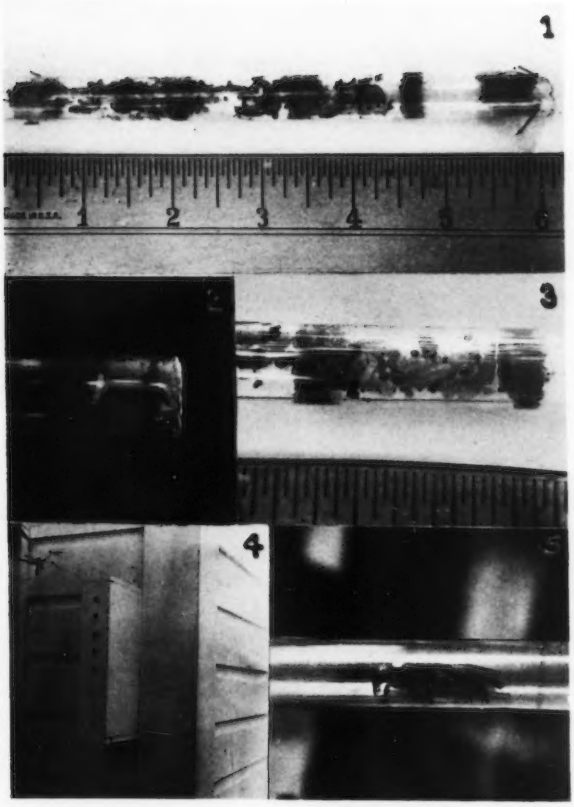
EXPLANATION OF PLATE

1. Glass tube showing three cells of *Monobia quadridens* and vestibule at outer end.
2. Egg of *Monobia quadridens* suspended from wall of glass tube. Mud partition shows at the inner end of the tube.
3. One cell filled with the larvae of *Desmia funeralis*. Pellets voided by the *Desmia* larvae are evident.
4. Observation box used to study the habits of *Monobia quadridens*.
5. *Monobia quadridens* resting in glass tube.

PERSONAL

Dr. Axel L. Melander has retired as Professor Emeritus. For the past 17 years, Dr. Melander has been professor and head of the Biology Department of the College of the City of New York. Before coming to New York, Dr. Melander was Entomologist for the Experiment Station and head of the Zoology Department of Washington State College. He is well known among entomologists as one of the early investigators of HCN resistance in scale insects, as a specialist in Diptera, especially Empididae, as past president of the Entomological Society of America, as one of the few entomologists honored with a star in American Men of Science, and in recent years as a leader in color photography of living insects. We wish him well, and hope he does not retire out of sight.



Monobia quadridens—Frost

A Note on the Rove-beetle, Staphlinus maculosis Grav.*

By PHIL RAU, Kirkwood, Missouri.

I recently received a specimen of this rove-beetle from a resident of Grubville, Missouri, with the notation that it had bitten its way into the skin of a dog, causing a large wound. When the dog was first treated, the beetle was found in the fur near the injury and was therefore suspected of inflicting it. No doubt the beetle was found as stated, but it is quite likely that the injury was caused by some other agency. The beetle probably entered the wound for the purpose of feeding on maggots that are often found in such places.

This beetle is known to feed upon insects. Ralph Voris (Trans. Acad. Sci. St. Louis 28: 241, 1934) has observed them kill and feed upon insects, some as large as June beetles and moths. The prey, says he, is eventually reduced to a liquid, and the beetle swallows the juice. If the beetles can successfully handle large, hard-bodied insects such as moths and beetles, what a sinecure it must be for them to grapple with soft-bodied creatures such as maggots. It is, I believe, quite likely that the beetle was attracted to the store of maggots, rather than to the dog.

Sylvatic Plague: The Recovery of Fleas from the Burrowing Owl and Its Burrow in a Plague Area in Alberta

By JOHN H. BROWN, University of Alberta, Edmonton, Alberta

Observations made in 1940, 1941 and 1942 in connection with the Alberta sylvatic plague survey showed that the Burrowing Owl, *Speotyto cunicularia,* was unusually abundant in the epizootic area at Hanna-Youngstown. As this bird lives in aban-

* Identified by A. E. Chapin.

doned ground squirrel and badger burrows and feeds on small rodents an attempt was made to study its probable relationship, as a host for rodent fleas, to the plague epizootic present amongst the Richardson ground squirrels, *Citellus richardsoni* Sabine, in that area.

It is well-known that the burrowing owl, although it usually kills its prey, will also feed on dead animals. In the epizootic area many of the ground squirrels die on the surface of the ground and are thus readily available. The burrowing owl invariably removes its victim to its burrow before it starts to feed, and it is this habit that accounts for the large number of rodent fleas in the burrow, and also for the presence of such fleas on the bird.

Jellison (1939) reported on the recovery of 109 live rodent fleas of six species from a burrowing owl nest in a plague area near Dillon, Montana. He also quotes from Rucker (1909) regarding the burrowing owl or booby owl of California as follows:

"There is reason to believe that the booby owl, which is a constant companion of the ground squirrel, occupying the same burrows with him, may play an important role in the dissemination of the epizootic. It is thought that this bird, flying from burrow to burrow, may carry infected fleas for long distances. If this be found true, the problem of the eradication of the epizootic will thereby be greatly complicated."

Wheeler, Douglas and Evans (1941) reported on the recovery of plague-infected fleas, *Echidnophaga gallinacea,* from a burrowing owl taken near a plague area in California.

Investigations

In 1940 three burrowing owl burrows were examined and a total of 47 fleas were recovered. These fleas were forwarded to Dr. R. J. Gibbons, Laboratory of Hygiene, Kamloops, B. C., for bacteriological examination. They were negative for *Pasteurella pestis.* No determination as to their species was made.

In 1941 a total of 43 burrowing owls were observed in the area, and 11 were shot and examined for ectoparasites. No

fleas were found. One burrow was examined and 37 fleas were recovered. These fleas were sent to the laboratory at Kamloops, but were not positive for plague. No determination as to flea species was made.

In 1942 a total of 32 burrowing owls were seen and 4 of these were shot. Two of these, on examination, yielded one flea each. One flea was determined as being *Oropsylla* (*Oropsylla*) *idahoensis* Baker, a species that is recorded by Eskey and Haas (1940) as being a plague vector. The other flea was tentatively determined as belonging to the species *Rectofrontia fraterna* Baker.

The following table summarizes the number of burrowing owls noted, the number shot, the fleas recovered from the shot birds, the number of burrows investigated and the number of fleas recovered from burrows for the period 1940 to 1942 inclusive.

Burrowing Owl Investigations

Year	*Birds Noted*	*Birds Shot*	*Fleas Recovered*	*Burrows Examined*	*Fleas Recovered*
1940	?	?	0	3	47
1941	43	11	0	0	0
1942	32	4	2	1	37
Totals	75	15	2	4	84

Summary

The Burrowing Owl, *Speotyto cunicularia,* was unusually abundant in the epizootic area at Hanna-Youngstown during 1940, 1941 and 1942. A total of 84 fleas were recovered from four burrows. Two of 11 birds shot harboured one flea each. One of these fleas was determined as being *Oropsylla* (*Oropsylla*) *idahoensis* Baker, a known plague vector.

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OBITUARY

Sir Edward Bagnall Poulton died on November 21, 1943 at the age of 87 years. He was well-known throughout the world as zoologist and entomologist. Until his retirement in 1933 he was Hope professor of Zoology at the University of Oxford. Among the many honors accorded him, he was a Corresponding Member of the American Entomological Society.

NOTES AND NEWS IN ENTOMOLOGY

The first issue of the NEWS in 1890 started with the sentence: "It has for some time been apparent to Entomologists in this country that there was unoccupied room for a journal of Entomology devoted less to the dry details of descriptive and classificatory work and more to the news and gossip which is always of interest to entomological workers." This attitude has been reaffirmed in letters and editorials published in 1921 and 1925. But the labor entailed in such a project is too great for the editorial staff alone. However, the editors propose to reinstate this heading and review from time to time some of the interesting developments and happenings in Entomology throughout the world—abbreviated reviews of fields, of single papers, of trends, of events, notes, news, comments. We can prepare some of these and will start the ball rolling again, but for full advantage to all, we solicit items of general interest. Remember, such items always have received priority over technical papers, and still do.

Insects are so diversified that it has been said, more or less seriously, that the hardest thing to find in entomology is a generalization without exceptions. Our knowledge of the insect cuticle now falls right in line with this complaint. For years

the cuticle has been viewed as simply a secreted chitinous sheet with a "waterproof" covering called the epicuticle. It might be hard or soft, transparent or with the outer layers impregnated with various pigments or showing brilliant physical colors, but even so it seems of fairly uniform composition. Within the last few years quite a number of papers have appeared by various authors. The chemistry of chitin was studied by Campbell [1] and others fifteen and more years ago, and it was pointed out that sclerites were formed by the addition of hardening agents to the cuticle. More recently it has been shown that chitin actually composes less than half of the total weight of dry cuticle. Trim [2] has shown that several proteins apparently related to sericin (silk) are present; Fraenkel & Rudall [3] showed by x-ray analyses that these proteins are polymerized with the chitin molecules to form a hard crystalline structure, as has also been shown by birefringence analyses of Browning [4] and earlier authors,[5] and Richards & Anderson [6] showed with the electron microscope that this polymerization occurs in layers parallel to the surface of the body.

Anatomical diversity within the chitinous part of the cuticle is also considerable. In addition to the structures necessary to explain physical (interference) colors, there are a series of pore canals that are usually too small to be seen clearly with the light microscope and were first convincingly demonstrated by Wigglesworth [7] and subsequently confirmed by Richards & Anderson [6] with the electron microscope. But the electron microscope studies revealed that while the cockroach (and presumably many insects) has 1,200,000 of these tiny helical canals traversing each square millimeter of the chitinous part of the cuticle (but not the epicuticle), mosquito larvae lack them entirely. But this cannot be a matter that adults possess pore canals and larvae lack them, for Dennell [8] now reports that *Sarcophaga* larvae have relatively gigantic pore canals. These canals in *Sarcophaga* are first hollow tubes, containing no one knows what, but as the cuticle ages in these larvae the canals become filled with a solid rod of chitin—they apparently re-

main hollow and fluid-filled in the cockroach and many other insects.

The epicuticle has generally been considered waxy, but Pryor [9] brings forward strong evidence to indicate that in the cockroach it is a protein layer which is tanned and then made hydrophobic by the addition of a lipid ("fat"), and further that there are several kinds of epicuticles chemically speaking. Finally, Richards & Anderson [5] point out that the epicuticle of the cockroach can be split into two different sheets but that of mosquito larvae is apparently a single sheet.

Cuticle permeability is of great importance to both the insect and the economic entomologist. Alexandrov [10] showed that it is a truly semipermeable membrane in dipterous larvae, with differences in different species. Eder [11] by comparing various insects, pointed out that the permeability to water is correlated with the presence of pore canals, hardness and a number of other variables. Richards & Anderson [5] present evidence indicating that the pore canals probably are not concerned in the permeability to oils. Robinson [12] has pointed out that tick and insect cuticles, unlike human skin, are more permeable to mineral oils than to vegetable oils. And quite recently in several fascinating papers Hurst [13] has presented and Wigglesworth [14] confirmed the picture of the insect cuticle being an asymmetrical membrane which is more permeable to materials moving in one direction than in the other direction.

So with some fifteen papers in the past five years the insect cuticle has changed and is changing further with each new paper from a simple paragraph to a highly complex and diversified chapter of entomology, a chapter in which few sweeping generalizations can be made today. A. G. RICHARDS, JR.

[1] Ann. Ent. Soc. Amer., 22: 401–426. 1929.
[2] Nature, 147: 115–116. 1941. Biochem. Journ., 35: 1088–1098. 1941. See also Lafon, Compt. Rend. Acad. Sci. (Paris), 212: 456–458. 1941.
[3] Proc. Roy. Soc. London, ser. B, 129: 1–35. 1940.
[4] Proc. Roy. Soc. London, ser. B, 131: 65–86. 1942.
[5] See Schmidt, W. J., Die Doppelbrechung von Karyoplasma, Zytoplasma und Metaplasma. Protoplasma Monographien, vol. 11. 1937.
[6] Journ. Morph., 71: 135–183. 1942.

[7] Quart. Journ. Micr. Sci., 76: 269–318. 1933.
[8] Nature, 152: 50. 1943.
[9] Proc. Roy. Soc. London, ser. B, 128: 378–407. 1940. See also Bergmann, Ann. Ent. Soc. Amer., 31: 315–321. 1938, and Lafon, Compt. Rend. Acad. Sci., 212: 456–458. 1941.
[10] Acta Zool., 16: 1–19. 1935.
[11] Zool. Jahrb., allg. Zool. u. Physiol. Tiere, 60: 203–240. 1940.
[12] Parasitology, 34: 113–121. 1942.
[13] Nature, 145: 462–463. 1940. Nature, 147: 388–389. 1941.
[14] Nature, 147: 116. 1941. Bull. Ent. Res., 33: 205–218. 1942.

Current Entomological Literature

COMPILED BY THE EDITORIAL STAFF.

Under the above head it is intended to note papers received at the Academy of Natural Sciences of Philadelphia and the University of Pennsylvania, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species will be recorded.

This list gives references of the current or preceding year unless otherwise noted. Continued papers, with few exceptions, are recorded only at their first installment.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

NOTE: The figures within brackets [ ] refer to the journal in which the paper appeared, as numbered in the List of Journals given at the end of the literature. The number of the volume, and in some cases, the part, heft, &c. is followed by a colon (:). References to papers containing new forms or names not so stated in titles are followed by (*); if containing keys are followed by (k); papers pertaining exclusively to Neotropical species, and not so indicated in the title, have the symbol (S).

Papers published in ENTOMOLOGICAL NEWS are not listed.

GENERAL—Allan, P. B. M.—Alder v. birch. [21] 55: 95–97. **Baten & Hutson.**—Precautions necessary in estimating populations of small animals. [12] 36: 501–04. **Bondar, G.**—Personalia. [105] 14: 313–19, port. **Cockerell, T. D. A.**—Nomenclature. [55] 19: 158–60. **Cooper & Ris.**—Handling small objects in bulk for cytological preparations. [Stain Techn.] 18: 175–76. **Eliot, N.**—Migration v. hibernation. [9] 76: 193–98. **Epling, C.**—Taxonomy and genonomy. [68] 98: 515–16. **Hayward, K. J.**—Primera lista de insectos Tucumanos peyudiciales. [79] Pub. Misc. 1, 110 pp. **Huffaker & Back.**—A study of methods of sampling mosquito populations. [12] 36: 561–68. **King, W. V.**—Some entomological aspects of troop mobilization. [12] 36: 577–79. **Levy, H. A.**—Dioxane as an aid in staining insect cuticle. [Stain Techn.] 18: 181–82. **Moore, H. W.**—A mechanical aspirator for sorting and counting insects in the field. [4] 75: 162. **Neiva, Arthur.**—Obituaries by Borgmeier, Lent, Taunay, Ribeiro, and Correa F.

[105] 14: 1–30, port. **Pereira, Hermano F. R.**—Obituary. [105] 14: 324–25. **Porter, Carlos E.**—Obituary. [105] 14: 321–24, port. **Townsend, C. H. T.**—**Personalia.** [105] 14: 311–13, port. Errors in economic entomology. [105] 14: 32. **Trehan, J. N.**—The role of predators in biological control of insect pests. [Current Sci., Calcutta] 12: 223–25.

ANATOMY, PHYSIOLOGY, ETC.—**Alexander & Barton.**—The excretion of ethylquinone by the flour beetle. [Biochem. Jour.] 37: 463–65. **Bodine & Tahmisian.**—The development of an enzyme (tyrosinase) in the parthenogenetic egg of the grasshopper, Melanoplus differentialis. [92] 85: 157–63. **Caspari, E.**—The influence of hatching order on the intensity of testis pigmentation in Ephestia kühniella. [42] 94: 241–60. **Cornman, I.**—Suspension of pole cell formation in Drosophila eggs by hydrostatic pressure. [Jour. Cell. and Comp. Physiol.] 22: 197–98. **Dethier, V. G.**—The dioptric apparatus of lateral ocelli. II. Visual capacities of the occellus. [Jour. Cell. and Comp. Physiol.] 22: 115–26. **Harries, F. H.**—Some effects of alternating temperatures and exposure to cold on embryonic development of the beet leaf hopper. [12] 36: 505–09. **Henson, H.**—The relations between embryogenesis and metamorphosis in insects. [Proc. Leeds Phil. & Lit. Soc.] Sci. Sect. 6: 97–110, ill. **Horn, A. B.**—Proof for multiple allelism of sex-differentiating factors in Habrobracon. [90] 77: 539–50. **Mazzotti, G. V. y L.**—Conservacion del virus del tifo en Triatoma bargeri. [56] 4: 211–13. **Pepper & Hastings.**—Age variations in exoskeletal composition of the sugar beet webworm and their possible effect on membrane permeability. [12] 36: 633. **Pontecorvo, G.**—Hybrid sterility in artificially produced recombinants between Drosophila melanogaster and D. simulans. [Proc. R. Soc. Edinburg] B 61: 385–97, ill. **Power, M. E.**—The effect of reduction in numbers of ommatidia upon the brain of Drosophila melanogaster. [42] 94: 33–72. **Quayle, H. J.**—The increase in resistance in insects to insecticides. [12] 36: 493–500. **Ris, H.**—A quantitative study of anaphase movement in the aphid Tamalia. [92] 85: 164–78. **Schwanwitsche, B. N.**—Stereomorphism in cryptic coloration of Lepidoptera. [31] 152: 508, ill. **Shields & Hull.**—The seasonal incidence of sand flies in Florida. [12] 36: 625. **Stone, M. W.**—The effect of winter soil temperatures on emergence of adults of the sugar-beet wireworm in cages. [12] 36: 510–15. **Thomas, H. D.**—Preliminary studies on the physiology of

Aedes aegypti. I. The hatching of the eggs under sterile conditions. [17] 29: 324–28. **Wigglesworth, V. B.**—The fate of haemoglobin in Rhodnius prolixus (Hemiptera) and other blood sucking arthropods. [Proc. R. Soc. Lond.] B 131: 313–39, ill. **Williams & Chadwick.**—Technique for stroboscopic studies of insect flight. [68] 98: 522–24. **Wilson, L. P.**—Tolerance of larvae of Drosophila for nucleic acid components: guanine. [Growth] 7: 273–78. Id. Tolerance of larvae of Drosophila for nucleic acid components: uracil. Ibid. 279–86. Id. Tolerance of larvae of Drosophila for nucleic acid components: cytosine. Ibid. 287–90.

ARACHNIDA AND MYRIOPODA—Barrows, W. M. —A new prairie spider. [43] 43: 209, ill. **Chamberlin, R. V.**—Some records and descr. of American Chilopods. [95] 56: 97–108 (*). On some gen. and sps. of Amer. millipeds. On Mexican millipeds. [Bul. Univ. Utah] 34: (6), 20 pp., ill.; (7), 103 pp., ill. (*). **Cooley, R. A.**—Ixodes dampfi n.sp. nueva garrapata de Mexico (Acarina). [35] 4: 21–24, ill. **Cooley & Kohls.**—Ixodes californicus, I. pacificus n.sp. and I. conepati n.sp. [55] 19: 139–47, ill. **Crane, J.**—Spiders of the fam. Lyssomanidae and Salticidae (Magoninae) from Br. Guiana and Venezuela. [18] 28: 125–38, ill. (*). **Davis, G. E.**—Studies on the biology of the argasid tick, Ornithodoros nicollei. [17] 29: 393–95. **McGregor, E. A.**—A new spider mite from Argentina. [10] 45: 176–78 (ill.). **Mello-Leitao, C.**—Solifugos de Argentina. [85] 40: 1–32, ill. (*). **Schiapelli y Gerschman.**—Aranas Argentinas. I. [85] 40: 317–32, ill. (*). **Schubart, O.**—Os myriapodes e suas relacoes com a agricultura. Com uma bibliografia completa sobre o assunto. Diplopoda de Pirassununga I. Primeiro diplopodo Europeu encontrado no Brasil. [77] 2: 205–34; 249–54, ill. **Soares, B. M.**—Contribuicao ao estudo dos opilioes da serra do mar. Opilioes de boracea. [77] 2: 1–13, ill. (*S). Alguns Tomisidas e um sakticida novos do Brasil. 255–65, ill. **Vail & Augustson.**—A new ectoparasite (Acarina: Cheyletidae) from domestic rabbits. [17] 29: 419–21.

THE SMALLER ORDERS—Clay, T.—Bird lice from the Tinamida. [Zool. Ser. Field Mus. N. H.] 24: 375–87, ill. (*S). **Gloyd, L. K.**—Enallagma vernalis a n.sp. of Odonata from Michigan. [114] no. 479: 8 pp., ill. **Guimaraes, L. R.**—Sobre alguns gen. e sps. de Heptapsogas-

teridae. Pp. 151–70, ill. (*). Dois n.gen. de malofagos de psitacideos exoticos. Pp. 79–95, ill. (*). Nota sobre o gen. Vernonia. P. 133. Novos gen. de malofagos parasitas de falconiformes. Pp. 235–47, ill. (*). Sobre as esp. do gen. Pseudolipeurus. Pp. 267–90, ill. (*). [all 77] 2: (all S). **Holland, G. P.**—A remarkable instance of retention of a double spermatheca in a dolichopsyllid flea, Opisocrostis brunneri. [4] 75: 175–76 (ill.). **Jameson, E. W., Jr.**—Notes on some fleas of New York State. [4] 75: 177. **Needham & Bullock.**—The Odonata of Chile. [Zool. Ser. Field Mus. N. H.] 24: 357–73, ill. (*k). **Speith, H. T.**—Taxonomic studies on the Ephemeroptera. III. Some interesting Ephemeridae from Surinam and other Neotropical localities. [40] no. 1244, 13 pp., ill. (*). **Starling, J. H.**—Pauropoda from the Duke forest. [10] 45: 183–200 (ill. *). **Wright, M.**—A comparison of the dragonfly fauna of the lower delta of the Mississippi River with that of the marshes of Central Gulf Coast. [27] 13: 481–97. **Wygodsinsky, P.**—Nota sobre um gen. de Lepismatideo ecitofilo (Thysan). [105] 14: 260–62, ill.

ORTHOPTERA—Liebermann, J.—Nahuelia rubriventris, n.gen. y n.esp. Argentina del grupo jivari (Acrid). [85] 40: 303–16, ill. **Toledo Piza, S., Jr.**—Um Proscopiida e um Phasmida nov. do Brasil. [105] 14: 287–91, ill.

HEMIPTERA—Beamer, R. H.—A new Atanus from Argentina, South America (Cicadellid). [10] 45: 178–79 (ill.). **Davidson & DeLong.**—Studies of the gen. Empoasca (Cicadel). [43] 43: 214–220 (*S). **DeLong, D. M.**—The Mexican leafhoppers of the gen. Cloanthanus and Scaphytopius (Cicadel). [Lloydia] 6: 157–95 (*). **Drake & Poor.**—Four n. Tingitidae from Argentina. [85] 40: 299–302. **Essig, E. O.**—Sumac-gall aphid, Melaphis rhois in Arizona. [55] 19: 147. **Islas, F.**—Notas sobre la variabilidad cromatica en Triatoma (T.) picturata. [112] 14: 243–49, ill. **Lange, W. H.**—An alternate host record for the aphid Thecabius populi-monilis. [55] 19: 133. **Lizer, C. A.**—Descr. de cuatro psilidos filocecidogenos (Hom.). [Notas del Mus. de la Plata] 8: 151–65, ill. (*S). **Monte, O.**—Critica sobre alguns gen. e sps. de Tingitideos. Uma nov esp. do gen. Monalonion (Mirid). [77] 2: 103–15, ill. (*). **Moul, E. T.**—Membracidae distribution in Pennsylvania. [Proc. Penna. Acad. Sci.] 17: 23–25. **Usinger, R. L.**—A taxonomic note on Aradus depictus. [55] 19: 138.

LEPIDOPTERA—D'Almeida, R. F.—Alguns tipos de gen. da ordem Lepidoptera. Rhopalocera, Mechanitidae. [77] 2: 179–96. **Eliot, N.**—(See under General). **Hayward, K. J.**—Nuevas esp. de hesperidos Brasilenos. [77] 2: 171–77, ill. La polilla taladradora de la cana de azucan (Elasmopalpus lignosellus). [79] Bol. 40: 9 pp., ill. El gusano chupador de la cana de azucar (Diatraea saccharalis). [79] Circ. 115: 11 pp., ill. **Hovanitz, W.**—The nomenclature of the Colias chrysotheme complex in N. Am. (Pierid). [40] no. 1240, 4 pp. (*). **Lichy, R.**—Observaciones y rectificaciones sobre lepidopteros recolectados por P. J. Anduze en los Estados orientales de Sucre y Monagas. [Bol. Soc. Venezolana Cie. Nat.] 8: 205–32. **Oiticica Filho, J.**—Sphingidae capturados em Porto Cabral (Margem Paulista do Rio Parana), com notas sobre nomenclatura. [77] 2: 97–102. **Schwanwitsch, B. N.**—Wing pattern in papilionid lepidoptera. [9] 76: 201–3, ill. **Snapp & Thomson.**—Life history and habits of the peachtree borer in the southeastern states. [3] Tech. Bull. 854, 24 pp., ill. **Tinkham, E. R.**—Description and biological notes on a new Saturnid of the gen. Pseudohazis from the Big Bend region of Texas. [4] 75: 159–62 (ill.). **Travassos Filho e Carrera.**—(See under Diptera).

DIPTERA—Alexander, C. P.—Records and descr. of Brazilian Tipulidae. IX. [105] 14: 291–310 (*). New or little-known Tipulidae from Sao Paulo. [77] 2: 39–77. **Dalmat, H. T.**—A contribution to the knowledge of the rodent warble flies (Cuterebridae). [17] 29: 311–18. **Dampf, A.**—La crisalida de Eusimulium ochraceum. [35] 4: 33–42, ill. **Guimaraes, L. R.**—Nova esp. do gen. Basilia do Brasil (Nycterib). [77] 2: 145–49, ill. **Guimaraes e Carrera.**—Contribuicao ao conhecimento dos Cuterebrideos do Brasil. [78] 3: 1–12, ill. (*). The gen. Culicoides in northern Colorado (Ceratopog.). [55] 19: 148–53, ill. (*). **James, M. T.**—A revision of the nearctic species of Adoxomyia (Stratiomyid). [10] 45: 163–71 (ill. k*). **King, Roth, Toffaleti & Middlekauff.**—New distribution records for the mosquitoes of the southeastern United States. [12] 36: 573–76. **Lane, J.**—Sobre o gen. Uranotaenia (Culicid). [105] 14: 137–66 (*S). **Lane & Cerqueira.**—Os sabetineos da America (Culicid). [78] 3: 473–843, ill. (*S). Sobre o gen. Cerioides (Culicid). [105] 14: 167–73 (*S). **Philip, C. B.**—Flowers as a suggested source of mosquitoes during encephalitis studies, and incidental mosquito records in the

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